Astronomy and Astrophysics 2007 vol.462 N3, pages L57-L60

Extensive multiband study of the X-ray rich GRB 050408: A likely off-axis event with an intense energy injection

De Ugarte Postigo A., Fatkhullin T., Jóhannesson G., Gorosabel J., Sokolov V., Castro-Tirado A., Balega Y., Spiridonova O., Jelínek M., Guziy S., Pérez-Ramírez D., Hjorth J., Laursen P., Bersier D., Pandey S., Bremer M., Monfardini A., Huang K., Urata Y., Ip W., Tamagawa T., Kinoshita D., Mizuno T., Arai Y., Yamagishi H., Soyano T., Usui F., Tashiro M., Abe K., Onda K., Aslan Z., Khamitov I., Ozisik T., Kiziloglu U., Bikmaev I., Sakhibullin N., Burenin R., Pavlinsky M., Sunyaev R., Bhattacharya D., Kamble A., Chandra C., Trushkin S.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

Aims. Understand the shape and implications of the multiband ligth curve of GRB 050408, an X-ray rich (XRR) burst. Methods. We present a multiband optical light curve, covering the time from the onset of the γ-ray event to several months after, when we only detect the host galaxy. Together with X-ray, millimetre and radio observations we compile what, to our knowledge, is the most complete multiband coverage of an XRR burst afterglow to date. Results. The optical and X-ray light curve is characterised by an early flattening and an intense bump peaking around 6 days after the burst onset. We explain the former by an off-axis viewed jet, in agreement with the predictions made for XRR by some models, and the latter with an energy injection equivalent in intensity to the initial shock. The analysis of the spectral flux distribution reveals an extinction compatible with a low chemical enrichment surrounding the burst. Together with the detection of an underlying starburst host galaxy we can strengthen the link between XRR and classical long-duration bursts. © ESO 2007.

http://dx.doi.org/10.1051/0004-6361:20066660

Keywords

Gamma rays: bursts, Techniques: photometric